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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,614	07/25/2001	Takeshi Kouno	520.40206X00	3460

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EXAMINER

GRAY, MICHAEL KUHN

ART UNIT	PAPER NUMBER
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3746

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DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/911,614

Applicant(s)

KOUNO ET AL.

Examiner

Michael K. GRAY

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6-10 and 15 is/are rejected.
- 7) ☒ Claim(s) 2,5,11,13,14,16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 6, 7.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

SECOND DETAILED ACTION

Background

The applicants on May 22, 2002, filed an Amendment (paper # 5) in response to the Office Action mailed November 22, 2002.

Claims 1-11 and 13-17 are now pending in the application. Claim 12 has been cancelled. Claims 1-11 have been amended and claims 13-17 have been newly added.

Drawings

The previous objection to the drawings is withdrawn. The drawings are accepted as being in a formal condition.

Title

The title of the application has been changed to "A Compressor Including Tapered Discharge Valve and Valve Seat" in accordance with the applicants' Amendment.

Claim Objections

In claim 1, at line six, after the word "having" the word --a-- should be inserted before the word "tapered"; at line 7, the word "surfaces" should be changed to --surface-- ; at line 8, after the word "away" the word --from-- should be inserted; at line 10, after the word "with" the word "--the-- should be inserted before the word "tapered.

In claim 4, lines 7-8, the words "tapered surface" should be changed to --a tapered surface--.

Claim Rejections - 35 USC § 112

As a result of applicants' Amendment, the previous claim rejections under 35 U.S.C. § 112 have been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 1/9, and 3/9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hugenroth et al. (6,132,191).

Hugenroth et al. teach a valve for use in a compressor with the valve opening to the discharge, i.e., working fluid, of a compression chamber. (col. 3, lines 1-50)

A valve seat portion (Figure 8) is provided around the discharge port. The valve seat is contoured or tapered to accommodate a contoured or tapered surface of a valve 172. When the valve is closed over the valve seat, the valve forms a line of contact with the valve seat. Since the bottom of the valve, i.e., that part which faces the discharge port, is curved or tapered, only a portion of the tapered surfaces of the valve contacts the valve seat. A cylindrical portion of the discharge port is demonstrated below valve 172 in Figure 8, above the cylindrical portion the discharge port increases in cross sectional area in a direction away from the compression or discharge chamber.

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A spring 178 acting on an end 186 of the valve acts as a retainer for positioning the valve on the valve seat portion.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1/10, 3/10, 6/9, 6/10, 7/9, 7/10, 8/9, 8/10, 4, 6-8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenroth et al. (6,132,191).

Hugenroth et al. teach a valve for use in a compressor with the valve opening to the discharge, i.e., working fluid, of a compression chamber. (col. 3, lines 1-50)

A valve seat portion (Figure 8) is provided around the discharge port. The valve seat is contoured or tapered to accommodate a contoured or tapered surface of a valve 172. When the valve is closed over the valve seat, the valve forms a line of contact with the valve seat. Since the bottom of the valve, i.e., that part which faces the discharge port, is curved or tapered, only a portion of the tapered surfaces of the valve contacts the valve seat.

A cylindrical portion of the discharge port is demonstrated below valve 172 in Figure 8.

Above the cylindrical portion the discharge port increases in cross sectional area in a direction away from the compression or discharge chamber.

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A spring 178 acting on an end 186 of the valve acts as a retainer for positioning the valve on the valve seat portion.

In Hugenroth et al. the valve seat portion 162 in Figure 8 can be viewed as including an end plate at the bottom region thereof with the area between the two lateral sides which extend from the bottom or end plate region representing a bore in which is situated the spring 178 and retaining elements. The valve seat portion and bore can be viewed as being coaxial. The retainer means of Hugenroth et al. includes an opening 166 through which working fluid can flow.

One of ordinary skill in the art would have realized that the valve type disclosed in Figure 8 can be used as a discharge valve so as to operate in conjunction with a variety of discharge chambers.

Thus, even though Hugenroth et al. do not disclose a piston and cylinder arrangement, it would have been obvious for one of ordinary skill in the art to employ a discharge valve as demonstrated in Figure 8 in conjunction with a piston-cylinder chamber to achieve efficient opening and closing of the discharge valve at desirable pressure conditions. The bottom or end plate of the valve seat portion of Hugenroth et al. would have been seen as obviously adaptable as an end plate for a piston cylinder.

As for claim 10 as it depends through claims 1, 3 and 6-8, Hugenroth et al. demonstrate a substantially cylindrical spring coil 178. A conically-shaped spring coil would also work in the Hugenroth et al. valve.

Since no other elements are claimed in the present application so as to make the particular shape of the spring a needed requirement, the use of a conical or cylindrical spring would have been a matter of obvious design choice.

Allowable Subject Matter

Claim 2, 2/9, 2/10, and 2/11, claims 13-14, 16-17, claims 5, 5/9, 5/10, 5/11 and claim 11 would be allowable if written in independent form including the subject matter of the base claim and any intervening claims.

The Hugenroth et al. reference in Figure 8 does not show a flat surface of the valve on the side of the compression chamber and the valve does not show both a conical and spherical portion. The Chambers reference which was applied in the initial Office Action (paper #3) does not demonstrate the end plate as claimed in claim 4.

The applicants have failed to claim the gap which exists between the tapered side of the valve and the tapered valve seat when the valve is closed. This gap is located below the "line contact" between the valve and valve seat. The gap would appear to be a patentably distinguishable feature in conjunction with the other claimed elements of claims 1 and 4.

Conclusion

In light of the necessity of applying a new reference to the newly amended and added claims, applicants arguments concerning the Chambers reference are rendered moot.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Gray whose telephone number is (703) 308-6196.

If the examiner does not answer the phone, a message will be provided as to when he will be in the Office. A message may be left on the examiner's voice mail.

The examiner's supervisor Timothy Thorpe can be reached at (703) 308-0102.

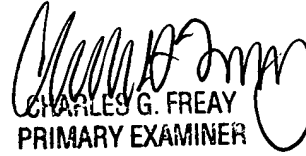
The examiner's fax number is (703) 746-4527.

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Any inquiry of a general nature should be directed to the receptionist whose telephone number is (703) 308-0861.

/Michael K. Gray *mkg*
Patent Examiner
Art Unit 3746


CHARLES G. FREAY
PRIMARY EXAMINER